Chapter 2 Biochemistry

1) A student conducted an experiment to study the effect of temperature on the function of salivary amylase. She placed the enzyme at -2°C for several hours. Later, she removed the enzyme at -2°C and mixed it with a solution of minced bread at 37°C. She performed an iodine test to check for the presence of starch in the solution and the result was negative. What do you conclude from this experiment?

a) Starch is still present since salivary amylase does not digest starch.
b) Low temperature denatured the enzyme rendering it inactive.
c) The enzyme has been activated by rising temperature and digested the starch.
d) Low temperature caused permanent deactivation of the enzyme.
e) The iodine test is a test used to detect the presence of monosaccharides, hence the negative result.

2) Water rises from the roots through the stem in a plant against the force of gravity due to the _____ force in water. However, what keeps the column of water together as the water rises is the _____ force between the water molecules.

a) adhesion, cohesion
b) cohesion, adhesion
c) cohesion, capillary action
d) surface tension, adhesion
e) capillary action, adhesion

Questions 3-5

Effect of Carbon Bonds on Melting Point			
Fatty acid	Number of Carbons	Number of Double Bonds	Melting Point (°C)
Lauric acid	12	0	43.8
Palmitic acid	16	0	62.9
Elaidic acid	18	1	45
Arachidonic acid	20	4	-50

3) Monounsaturated fats are considered healthier than other types of fats. Which of the following is monounsaturated?
a) Lauric acid
b) Palmitic acid
c) Elaidic acid
d) Arachidonic acid
e) None of the above

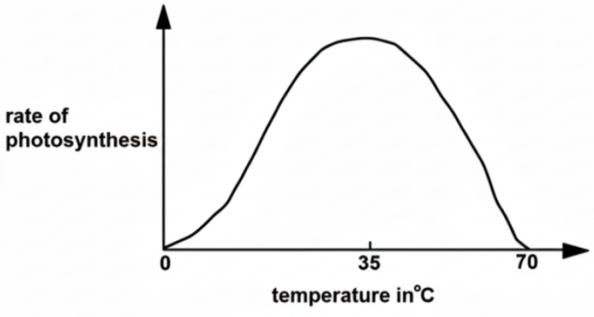
4) If room temperature is 25°C, which fatty acid is solid at room temperature?

I. Lauric acid
II. Palmitic acid
III. Arachidonic acid

a) I only
b) III only
c) I and II only
d) II and III only
e) I, II, and III

5) What is the relationship between the melting point of a fatty acid and the number of carbon-carbon double bonds?

a) As the number of double bonds increases the melting point increases.
b) As the number of double bonds increases the melting point decreases.
c) The melting point of all saturated fatty acids is the same.
d) High number of double bonds causes the fatty acid to solidify faster.
e) The melting point is not affected by the number of double bonds.

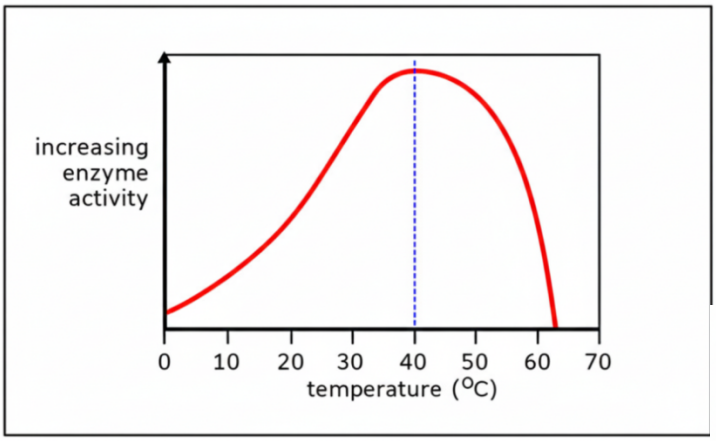


6) The graph shows that the rate of photosynthesis increases as the temperature increases, followed by a sharp decrease in the rate to reach 0. The reason behind this is that

a) temperature is the limiting factor in photosynthesis.
b) at high temperatures water molecules will vaporize causing the process of photosynthesis to stop.
c) at high temperatures the chloroplasts will release all its pigments thus reducing the capture of light.
d) the enzymes responsible for photosynthesis are denatured at high temperatures.
e) other factors such as the presence of carbon dioxide and light interfered in the rate of photosynthesis.

7) A solution with a pH of 3 is _____ times more acidic than one with a pH of 6.

a) 2
b) 3
c) 10
d) 100
e) 1,000



Based on the data, what results can be predicted if the experiment is carried out at 62°C?

a) No prediction would be valid.
b) An amount of product equal to that at 20°C would form.
c) An amount of product equal to that at the optimum temperature would form.
d) An amount of product equal to that at 5°C would form.
e) Little or no product would form.

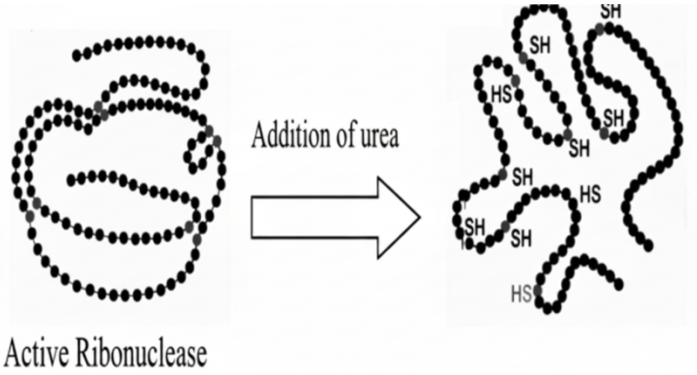
9) A scientist performed an experiment to determine the effect of temperature on the length of the cell cycle in one species. The duration of the cell cycle at room temperature is 15 hours. He cultured identical stem cells in four culture media with the same content of nutrient and oxygen gas but at different temperatures. The duration of the cell cycles at different temperatures are recorded in the following table.

The data in the table shows that

Temperature (°C)	Length of the cell cycle (hours)
10	54.6
15	29.8
20	18.8
25	13.3

a) cells divide faster as the temperature decreases.
b) the length of the cell cycle is not affected by temperature.
c) the length of the cell cycle is inherited and not affected by temperature.
d) cells divide faster as the temperature increases.
e) B and C

10) The following figure shows the structure of Ribonuclease enzyme before and after addition of urea.



Which statement is true about Ribonuclease enzyme?

a) Urea causes the denaturation of the Ribonuclease enzyme but the enzyme maintains its activity.
b) Urea causes the denaturation of the Ribonuclease enzyme and the enzyme loses its activity.
c) Urea causes the denaturation of the Ribonuclease enzyme and the enzyme maintains 50% of its activity.
d) Urea causes a modification in the sequence of amino acids of the Ribonuclease enzyme to make it inactive.
e) Urea causes a modification in the number of amino acids of the Ribonuclease enzyme without affecting its activity.

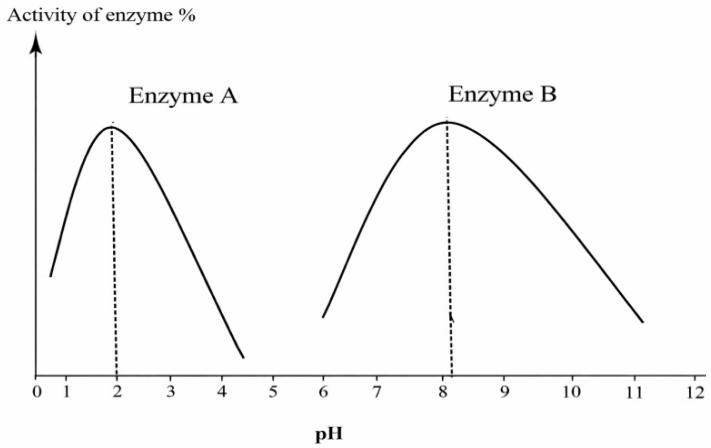
11) Which of the following are intermolecular attractions?

I. Ionic bonds
II. Hydrogen bonds
III. Covalent bonds
IV. Van der Waals force

a) I only
b) I and III
c) II and III
d) II and IV
e) II, III and IV

Questions 12 and 13

The following graph studies the activity of 2 different enzymes as a function of pH.



12) From the above graph we can conclude that

a) Enzyme A is found in the intestine and enzyme B is found in the stomach

b) Enzyme A is found in the mouth and enzyme B is found in the intestine

c) Enzyme A is found in the stomach and enzyme B is found in the intestine

d) Enzyme A is found in the stomach and enzyme B is found in the mouth

e) Both enzymes A and B are found in the stomach

13) At pH 7,

a) The amount of substrate obtained by enzymes A and B is 50% and 0% respectively

b) The amount of substrate obtained by enzymes A and B is 10% and 0% respectively

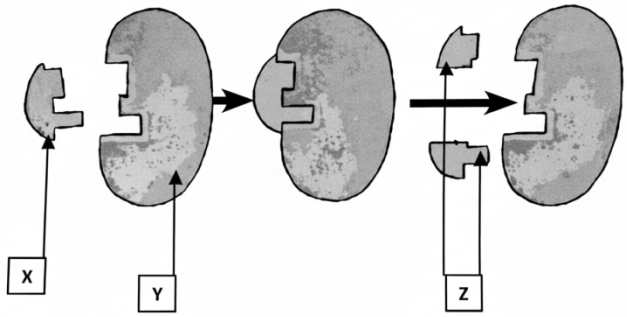
c) The amount of substrate obtained by enzymes A and B is 0% and 50% respectively

d) The amount of substrate obtained by enzymes A and B is 0%

e) The amount of substrate obtained by enzymes A and B is 100%

Questions 14-15:

The following figure represents the action of an enzyme on a substrate.



14) X, Y, and Z are respectively:

a) Enzyme, product, substrate
b) Product, enzyme, substrate
c) Substrate, enzyme, product
d) Product, substrate, enzyme
e) Enzyme, substrate, product

15) The type of reaction catalyzed by this enzyme is:

a) Synthesis reaction
b) Decomposition reaction
c) Mechanical break down
d) Neutralization reaction
e) Displacement reaction

16) Which of the following organic compounds is capable of performing the following functions: transport substances, make hormones and speed up reactions?

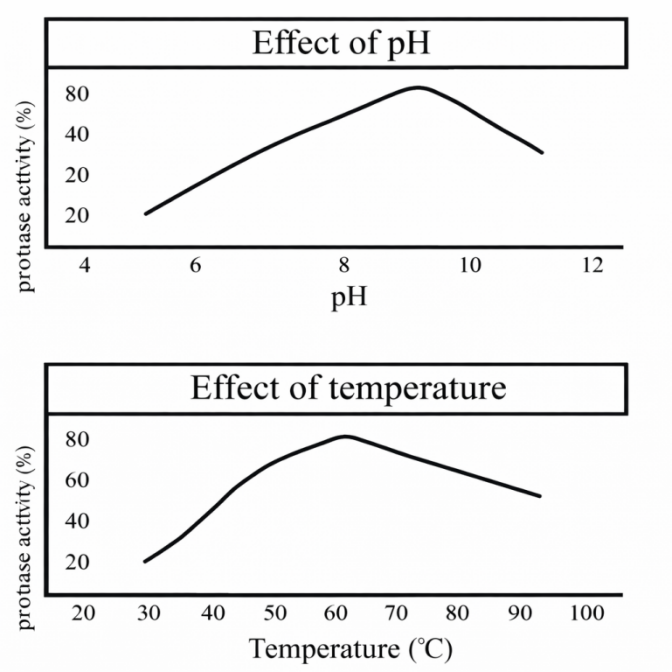
a) carbohydrates
b) proteins
c) lipids
d) nucleic acids
e) A and B

17) One of the following proteins is not an enzyme. Which one?

a) The intestinal lipase
b) The salivary amylase
c) The pancreatic insulin
d) The gastric pepsin
e) The pancreatic trypsin

18) Protein proteases are enzymes found in laundry detergents that help in breaking down stains such as blood, sweat and eggs. The graphs below show the effect of temperature and pH on the activity of these enzymes. Based on the graphs, the label on the detergent box would most probably state the following:

“This detergent is _____ and works best at a temperature range of _____.”



a) acidic, 30°C–50°C
b) acidic, 55°C–65°C
c) basic, 40°C–55°C
d) basic, 55°C–65°C
e) neutral, 70°C–90°C